EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 02147651
PUBLICATION DATE : 06-06-90

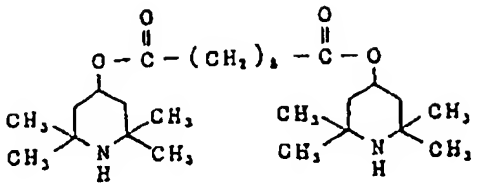
APPLICATION DATE : 11-10-88
APPLICATION NUMBER : 63255594

APPLICANT : MITSUBISHI KASEI VINYL CO;

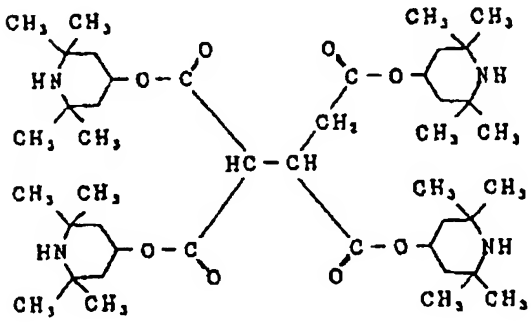
INVENTOR : TANAKA KEIJI;

INT.CL. : C08L 27/04 C08K 5/00 C08K 5/53 // A01G 9/14 A01G 13/02

TITLE : FLUORESCENT FILM OF AGRICULTURAL VINYL CHLORIDE RESIN



I



II

ABSTRACT : PURPOSE: To obtain the title film which can keep its fluorescence even after being used for a long time by mixing a vinyl chloride resin with a fluorescent agent which can be excited with ultraviolet rays, a phosphoric ester or a hindered amine compound.

CONSTITUTION: The title film is produced by adding a fluorescent agent which can be excited with ultraviolet rays (e.g. oxazole fluorescent agent), a phosphoric ester (e.g. tricresyl phosphate) or a hindered amine compound [e.g. bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate or tetrakis(2,2,6,6-tetramethyl-4-peperidyl) propane-1,1,2,3-tetracarboxylate] to a vinyl chloride resin. This film is featured in that, when used outdoors, it can keep its fluorescence to convert ultraviolet rays to light useful for the growth of plants for a long time, can utilize ultraviolet rays sufficiently for the exicitation of the fluorescent agent and can sufficiently supply useful light.

COPYRIGHT: (C)1990,JPO&Japio

INSDOCID: <JP_402147651A_AJ_>

XP008015021

Indian Journal of Chemistry
Vol. 32B, September 1993, pp. 981-983

(3)

PD

Synthesis and antileishmanial activity of 5, 10-dihydropyrido[2, 3-*d*: 6,5-*d'*]-dipyrimidine-5-(substituted phenyl)-2, 4, 6, 8-[1*H*, 3*H* -7*H*, 9*H*]-tetraones

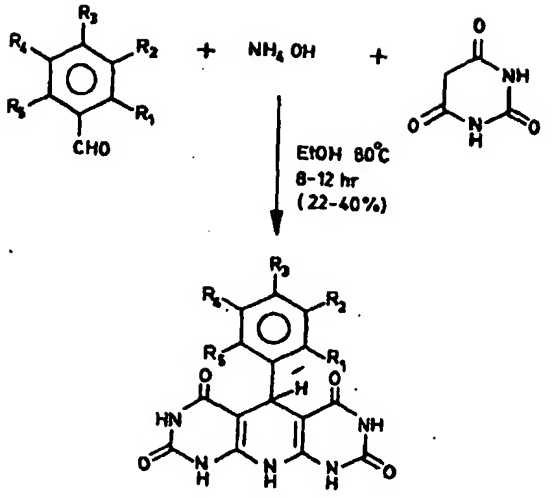
R K Khajuria, S R Sharma & S M Jain*
Department of Chemistry
and
Shalini Sharma & Aruna Kapil
Department of Pharmacology, Regional Research Laboratory, Jammu 180 001

Received 14 January 1993; accepted 8 April 1993

5, 10-dihydropyrido-[2, 3-*d*: 6, 5-*d'*]-dipyrimidine-5-(substituted phenyl)-2, 4, 6, 8-[1*H*, 3*H*-7*H*, 9*H*]-tetraones (1-18) have been prepared by the condensation of substituted benzaldehydes with barbituric acid in the presence of ammonium hydroxide using ethanol as a solvent and their structures established by IR, PMR, ^{13}C-NMR and mass spectral data. The compounds (1-18) have been tested for antileishmanial activity.

Fused pyrimidines are common structural source to develop new potential therapeutical agents. Among these 5-deaza flavins have been studied in both enzymatic and model systems to provide mechanistic insight into the flavin catalyzed reactions. The fused pyrimidines 5, 10-dihydropyrido-[2, 3-*d*: 6,5-*d'*]-dipyrimidine-2, 4, 6, 8-[1*H*, 3*H*-7*H*, 9*H*]-tetraones are used in the oxidation of alcohols as NAD(D^+) models and are of great importance because of their role in the biomimetic oxidations[1,2]. These type of compounds have been found to possess antibiotic and antibacterial activity[3].

In continuation to our programme on the synthesis of biologically active nitrogen heterocycles[4-9], we prepared 5, 10-dihydropyrido[2, 3-*d*: 6,5-*d'*]-dipyrimidine-5-(substituted phenyl)-2, 4, 6, 8-[1*H*, 3*H*-7*H*, 9*H*]-tetraones (1-18). These compounds were characterized on the basis of their IR, PMR ^{13}C-NMR and mass spectral data. In the ^{13}C-NMR spectrum of compound 4 C-5 appeared at δ32.0 and C-9a and C-10a at 162.0 whereas the signals for C-4a and C-5a appeared at 112.0. In the PMR spectrum, a singlet at δ 5.83 appeared for H-5, a doublet at 8.10 (J = 9Hz) was assigned to the H-3' and H-5' and a doublet at 7.15 (H = 9Hz) was assigned to H-2' and H-6'. In the mass spectrum the molecular ion peak appeared at m/z 370 whereas the peak at m/z 228 was due to the fragment formed by the loss of the two dicarbonyl amino moieties from M^+.



1-18

In vitro antileishmanial activity

The *Leishmania donovani* strain UR-6 was obtained from Indian Institute of Chemical Biology, Calcutta and maintained on biphasic medium at 22°C in an incubator.

Promastigote parasite of stationary phase (1×10^5 parasites/ml) were taken in culture tubes containing solid part as Brain Heart Infussion-Agar (BHI-Agar) and liquid part as Hank's Balance Salt Solution (HBSS). To these tubes 100 µg/0.1 ml each of compounds and pentamidine were added respectively. The control which was inoculated with the same volume of DMSO as that used to dissolve the drug, added to the treated tubes, and the tubes were inoculated for three days at 21°C. The whole operation was carried out aseptically in an ultraviolet cabinet. Antileishmanial activity of each of the compounds was determined by counting the number of live parasites per field microscopically and per cent mortality was calculated. The results are recorded in Table 1.

Experimental

Melting points were taken on a technical S.L. 152 melting point and boiling point apparatus and are uncorrected. IR spectra were recorded in KBr on a shimadzu IR-435 spectrophotometer and PMR and ^{13}C spectra on 60 MHz T-60A varian and Jeol FX-90 Q spectrometer respectively using TMS as int-

ISDOCID: <XP___8015021A__1_>

Table 1—Physical and pharmacological data of 5, 10-dihydropyrido-[2, 3-*d*: 6-5-*d'*]-dipyrimidine-5-(substituted phenyl)-2, 4, 6, 8-1*H*, 3*H*-7*H*, 9*H*-tetraones

Compd*	R_1	R_2	R_3	R_4	R_5	m.p. (°C)	Yield (%)	Mol. formula (M^+)	Antileishmanial† activity (inhibition %)
1	H	NO_2	H	H	H	254	28	$C_{15}H_{10}N_6O_6$ (370)	65.00±3.00
2	NO_2	H	H	H	H	282	30	$C_{15}H_{10}N_6O_6$ (370)	40.00±5..00
3	H	OCH_3	OH	NO_2	H	230	24	$C_{16}H_{12}N_6O_8$ (416)	35.00±3.00
4	H	H	NO_2	H	H	235	29	$C_{15}H_{10}N_6O_6$ (370)	86.00±2.00
5	H	OCH_3	H	I	H	262	26	$C_{16}H_{12}N_5O_5I$ (482)	65.00±3.00
6	H	OH	H	H	H	280	32	$C_{15}H_{11}N_5O_5$ (341)	50.00±2.00
7	OH	H	OH	H	H	282	34	$C_{15}H_{11}N_5O_6$ (357)	60.00±5.00
8	OH	OH	H	H	H	284	27	$C_{15}H_{11}N_5O_6$ (357)	66.00±3.00
9	OH	H	H	OH	H	284	32	$C_{15}H_{11}N_5O_6$ (357)	45.00±5.00
10	H	OH	NO_2	H	H	236	32	$C_{15}H_{10}N_6O_7$ (386)	85.00±3.00
11	NO_2	H	H	OH	H	286	30	$C_{15}H_{10}N_6O_7$ (386)	45.00±5.00
12	H	OH	OH	H	H	283	34	$C_{15}H_{11}N_5O_6$ (357)	50.00±5.00
13	H	O−CH_2−O		H	H	285	38	$C_{16}H_{11}N_5O_6$ (369)	65.00±2.00
14	H	H	$N(CH_3)_2$	H	H	269	40	$C_{17}H_{16}N_6O_4$ (368)	60.00±1.00
15	H	OCH_3	OH	H	H	285	32	$C_{16}H_{13}N_5O_6$ (371)	55.00±5.00
16	OH	OCH_3	H	H	H	282	34	$C_{16}H_{13}N_5O_6$ (371)	40.00±1.00
17	H	H	OCH_3	H	H	255	28	$C_{16}H_{13}N_5O_5$ (355)	20.00±1.00
18	H	OCH_3	OH	H	H	284	22	$C_{16}H_{13}N_5O_6$ (371)	50.00±5.00

* All the compounds have been characterized by PMR, mass and IR sperctral data. All the compounds have been crystallised from methanol and gave satisfactory C, H, N analyses.
† The data are the means ±S.D. of triplicate determinations from three experiments.

ernal standard (chemical shifts in δ, ppm). ^{13}C NMR values were taken from the decoupled spectra. Mass spectra were obtained on a Jeol JMS-D 300 mass spectrometer.

5, 10-*dihydropyrido*-[2, 3-*d*: 6, 5-*d'*]-dipyrimidine-5-(substituted phenyl)-2, 4, 6, 8-[1H, 3H-7H-9H]-tetraones (**1-18**): *General procedure*

A mixture of substituted benzaldehyde (1.5 g), barbituric acid (2.32g), and ammonium hydroxide (3 ml) was refluxed in ethanol (30 ml) for 6-8 hr. The solution was reduced to about half its volume and allowed to cool. The solid thus separated out was crystallised from methanol to give compounds **1-18**.

5, 10-*dihydropyrido*-[2, 3-*d*:6, 5-*d'*]-*dipyrimidine*-6-(*4-nitrophenyl*)-2, 4, 6, 8-1*H*, 3*H*-7*H*, 9*H*-*tetraone* (**4**)

A solution of 4-nitrobenzaldehyde (1.15g) barbituric acid (2.32 g) and ammonium hydroxide (3 ml) in ethanol (30 ml), was refluxed and reaction was completed after 7 hr as moniteredby TLC ($CHCl_3$: MeOH; 85:15). The reaction mixture was reduced to about half its volume and allowed to cool. The solid thus separated was crystallized from ethanol to furnish orange coloured crystals of 4; PMR (DMSO-d_6): 8.10(d, 2H, J = 9.0 Hz, H-3' and H-5'), 7.15 (d, 2H, J = 9.0 Hz, H-2' and H-6') 5.83 (s, 1H, H-5); ^{13}C-NMR (DMSO-d_6): δ165.0 (C=O), 162.0 (C-9a

and C-10a), 160.0(C=O), 147.0 (C-4′) 141.0 (C-1′), 127.0 (C-2′ and C-6′) 112.0 (C-4a and C-5a), 32.0 (C-5): MS: m/z 370 (M^+, 228, 224, 198, 197 and 107. IR (KBr): 3100, 1740, 1620, 1530, 1370, 1130, 1020, 880 cm^{-1}. In a similar manner the remaining compounds were prepared, purified and characterized on the basis of their PMR, IR and mass spectral data.

References

1 Tomohisa N, Hirotake Y, Masani O, Shingeki T & Fumio Y, *J chem Soc Perkin Trans*-1, 16 (1992) 2101.

2 Tomohisa N, Yoshiharu S & Fumio Y, *Synthesis*, 9(1983)93.

3 Bernadette K B, Judith A W, Phillip D C & Raymond N C, *J heterocycl Chem*, 12 (1975) 1221.

4 Jain S M, Ravi Kant, Sarin A N, Dhar S K & Dhar K L, *Indian J Chem*, 28B (1989) 790.

5 Jain S M, Ravi Kant, Sunita Devi, Dhar K L, Surjeet Singh, Bani S & Sing G B, *Indian J Chem*, 29B (1990) 95.

6 Jain S M, Khajuria R K, Dhar K L, Surjeet Singh & Singh G B, *Indian J Chem*, 29B (1990) 277.

7 Jain S M, Khajuria R K & Dhar K L, *Indian J Chem*, 29B (1990) 362.

8 Jain S M, Khajuria R K, Dhar K L, Surjeet Singh & Singh G B, *Indian J Chem*, 30 (1991) 805.

9 Jain S M, Khajuria R K, Dhar K L, Surjeet Singh, Bani S, Singh G B & Pahwa G S, *Indian J Chem*, 30B (1991) 1037.

ISDOCID: <XP___8015021A__I_>

THIS PAGE BLANK (USPTO)